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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,684	02/15/2006	Dan Andreyevitch Yanson	305832-00109	8311

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EXAMINER

GOLUB, MARCIA A

ART UNIT	PAPER NUMBER
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2828

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05/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/524,684	Applicant(s) YANSON ET AL.	
	Examiner MARCIA A. GOLUB	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 3,5,6,9,15,17,19,20,23 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,8,10-14,16,18,21,22 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION
Election/Restrictions

Applicant's election without traverse of Fig 2 in the reply filed on 4/24/08 is acknowledged. The applicant indicated that claims 2, 4, 7, 8, 10-14, 16, 21, 22 and 24-26 read on the figure. The examiner points out that claim 18 (similar to claim 4) also reads on the elected species, therefore claim 18 is being considered along with the other claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 7, 8 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama (5,586,138) hereinafter '138.

Fig 1 of '138 discloses a monolithically integrated optical device comprising:

1. "a first optical cavity [L1] having a first optical axis and supporting first optical modes;

a second optical cavity [L2] having a second optical axis [same as the first optical axis] and second, different, optical modes than the first optical cavity; [the cavities have different optical modes since they are of different lengths]

the first and second optical cavities being laterally offset from one another [the lateral direction is not defined by the claim, the cavities are offset from one another since they are not overlapping]

and at least partially separated by a photonic crystal material [4] in which the dielectric function of the material exhibits a periodic variation as a function of linear distance through the material [this definition of the photonic crystal matches the definition of the grating],

such that optical coupling between the first and second cavities is achieved

through the photonic crystal.”

2. “in which the first and second optical axes are parallel.” [the axis are on the same line]
4. “in which the first and second optical cavities are of different lengths [$L_1 < L_2$].”
7. “in which neither of the cavity end mirrors of the first optical cavity is co-planar with either cavity end mirror of the second optical cavity.” [all the end mirrors are located on different planes]
8. “in which the first and second optical cavities are separated by the photonic crystal material along lateral edges thereof.” [lateral direction is not defined by the claim, the cavities are separated by the grating]
11. “in which the photonic crystal material exhibits a periodicity along an axis parallel to the first and/or second optical axis.” [distributed feedback grating is periodical in this direction]

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 7, 8, 10-14, 16, 18, 21, 22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Happ et al. (“Single-mode operation...” found in IDS hereinafter IDS1, and further in view of Zhou et al. (Processing and characterization...” found in IDS) hereinafter IDS2.

Fig 1 of IDS1 discloses a monolithically integrated optical device comprising:
1,13,14. “a first optical cavity having a first optical axis and supporting first optical modes;

a second optical cavity having a second optical axis and second, different, optical modes than the first optical cavity;

the first and second optical cavities being at least partially separated from each

other by photonic crystal material such that optical coupling between the first and second cavities is achieved through the photonic crystal material;

the dielectric function of the photonic crystal material exhibiting a periodic variation as a function of linear distance through the material.”

IDS1 does not disclose:

“the photonic crystal material being formed in a quantum well intermixed region of the substrate in which the device is formed”

However, quantum well intermixing of the photonic bandgap crystals is well known in the art as evidenced by IDS2.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of IDS2 into the device of IDS1 by quantum well intermixing the area where the photonic crystal is formed for at least the purpose of controlling the refractive index and bandgap of the coupling area between the cavities.

2,16. “in which the first and second optical axes are parallel.” [the axes are on the same line]

4,18. “in which the first and second optical cavities are of different lengths.” (see Fig 1)

7,21. “in which neither of the cavity end mirrors of the first optical cavity is co-planar with either cavity end mirror of the second optical cavity.” [all the end mirrors are located on different planes]

8,22. “in which the first and second optical cavities are separated by the photonic crystal material along lateral edges thereof.” [lateral direction is not defined by the claim, the cavities are separated by the grating]

10-12, 24-26. “in which the photonic crystal material exhibits periodicity along two or more axes.” [photonic crystal disclosed exhibits periodicity in orthogonal and parallel directions]

Contact Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCIA A. GOLUB whose telephone number is (571)272-8602. The examiner can normally be reached on M-F 9-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Art Unit: 2828

supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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/Minsun Harvey/
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